

OCT 21 2011

## 510(k) SUMMARY

**Date of Summary**

October 19, 2011

**Product Name**

VRESelect™ Media

**Sponsor**

Bio-Rad  
3 Boulevard Raymond Poincaré  
92430 Marnes-la-Coquette  
France

**Correspondent**

MDC Associates, LLC  
Fran White, Regulatory Consultant  
180 Cabot Street  
Beverly, MA 01915

**Substantially Equivalent Device**

VRESelect™ is substantially equivalent to the Thermo Fisher Scientific (formerly Remel) Spectra VRE Chromogenic Media (reference 510(k) K092819) and the Thermo Fisher Bile Esculin Azide Agar with 6µg/mL vancomycin (reference 510(k) K972359). The predicate device Package Inserts are included for reference (see Appendix II).

Manufacturer: Thermo Fisher Scientific (formerly Remel)  
Products: Spectra VRE Chromogenic Media  
Bile Esculin Azide Agar with 6µg/mL vancomycin

Product Attribute	Bio-Rad VRESelect™	Spectra VRE	Bile Esculin Agar	Substantial Equivalent
Intended use	VRESelect™ is a selective and differential chromogenic medium, containing 8µg/mL of Vancomycin, for the qualitative detection of gastrointestinal colonization of vancomycin-resistant <i>Enterococcus faecium</i> (VREfm) and vancomycin-resistant <i>Enterococcus faecalis</i> (VREfs) and to aid in the prevention and control of vancomycin-resistant <i>Enterococcus</i> (VRE) in healthcare settings. The test is performed on rectal swabs from patients to screened for VRE colonization. VRESelect™ is not intended to diagnose VRE infection nor to guide or monitor treatment of infection. Results can be interpreted after 24 to 28 hours incubation. Subculture to non-selective media (e.g., trypticase soy agar with 5% sheep blood) is need for susceptibility testing and epidemiological typing.	Remel Spectra VRE is a selective and differential chromogenic medium, containing 6µg/mL of Vancomycin, intended for use in the qualitative detection of gastrointestinal colonization with vancomycin-resistant <i>Enterococcus faecium</i> and <i>Enterococcus faecalis</i> (VRE) to aid in the prevention and control of VRE in healthcare settings. The test is performed with a rectal swab and fecal specimens from patients to screen for VRE colonization. Spectra VRE is not intended to diagnose VRE infection or to guide or monitor treatment for infections. Subculture to non-selective media (e.g. Tryptic Soy Agar with 5% sheep blood) is needed for further identification, susceptibility testing, and epidemiological typing.	Remel's Bile Esculin Azide Agar w/ 6µg/mL vancomycin is a plated medium recommended for use in qualitative procedures as a selective and differential medium for the primary isolation of vancomycin-resistant enterococci from surveillance cultures. This product is not intended for use as [a] method of antimicrobial susceptibility testing. Confirmation of resistance by an approved method is recommended as some organisms on initial isolation may overcome the inhibitory effects of the medium.	✓
Methodology	Enzymatic	Enzymatic	Enzymatic	✓
Inoculation	Direct or indirect	Direct specimen	Direct specimen	✓

Sample Type	Rectal swabs	Rectal swabs or fecal specimens	Fecal or urine specimens	
Interpretation	Manual. Visual	Manual. Visual	Manual. visual	✓

### **Product Description**

VRESelect™ is a selective medium for the detection of vancomycin-resistant *Enterococcus* (VRE). The selectivity of this medium is based on the presence of an antifungal/antibiotic mixture that inhibits the growth of most yeast, Gram negative and Gram positive bacteria, with the exception of vancomycin-resistant Enterococci (VRE).

Detection is based on the cleavage of chromogenic substrates by specific enzymes of *Enterococcus faecium* which produces pink colonies and *Enterococcus faecalis* which produces blue colonies.

*Enterococcus gallinarum* and *Enterococcus casseliflavus* are intrinsically resistant to vancomycin and may grow on the VRESelect™ medium as colorless or white colonies because they do not metabolize the chromogenic substrates. Vancomycin susceptible enterococci are inhibited.

After 24 to 28 hours incubation pink colonies can be reported as VREfm. Blue colonies should be confirmed by a catalase test and susceptibility testing (refer to limitation 8 in package insert).

### **Intended Use**

VRESelect™ is a selective and differential chromogenic medium, containing 8µg/mL of vancomycin, for the qualitative detection of gastrointestinal colonization of vancomycin-resistant *Enterococcus faecium* (VREfm) and vancomycin-resistant *Enterococcus faecalis* (VREfs) and to aid in the prevention and control of VRE in healthcare settings. The test is performed on rectal swabs from patients to screen for VRE colonization. VRESelect™ is not intended to diagnose VRE infection nor to guide or monitor treatment of infection. Results can be interpreted after 24 to 28 hours incubation. Subculture to non-selective media (e.g., trypticase soy agar with 5% sheep blood) is needed for susceptibility testing and epidemiological typing.

### **Performance Data**

#### **Interfering Substances**

The following potential interfering substances were tested to confirm that they did not interfere with the performance of the VRESelect™ media:

- Dulcolax, Adult Glycerin Suppositories, Vaseline, Preparation H, Original Boudreaux's Butt Paste, Tuck's Medicated Cooling Pads, Pepto-Bismol, Miconazole cream, Nonoxynol-9 (spermicide), KY Jelly, and Pepcid AC Max strength.
- Blood and Mucins
- Three commonly used transport media – Amies without charcoal, Cary Blair, and LQ Stuart

The interfering substances tested caused no significant differences between the number of colonies observed on the Control plates and the number of colonies observed on the VRESelect™ plates. The only exceptions were Tuck's Medicated Cooling Pads (coloration delayed after 24 hours with VREfm (ATCC 700221)) and Miconazole cream. The blood and mucins caused a delayed growth of one VREfs (ATCC 51299).

#### **Cross Reactivity Testing (Analytical Specificity)**

A cross-reactivity study was performed to determine if strains other than vancomycin-resistant enterococci could grow on VRESelect™. One hundred nineteen (119) microorganisms representing Gram-negative rods, Gram-positive cocci, and yeasts were evaluated with the VRESelect™. No cross-reactivity was observed with any strain tested. No variation was seen between 24 and 28 hour incubation time.

#### Recovery Study

The minimum concentration of VRE reliably detected by VRESelect™ is 10<sup>3</sup> CFU/mL.

To determine the percent recovery for the VRESelect™ media a panel of eighteen vancomycin-resistant enterococci – 8 VREfm and 10 VREfs – were tested at varying dilutions. For each strain to be tested a 0.5 McFarland suspension of the strain was prepared, A series of 10-fold serial dilutions in saline were carried out and inoculated onto three lots of VRESelect™ plates and one lot of Blood Agar plates. The plates were incubated at 35-37°C ambient air and read at 24 and 28 hours. The color and number of colonies were recorded. The Blood Agar plates were used to confirm the inoculum concentration at each dilution. Data confirmed that the minimum concentration of VRE reliably detected by VRESelect™ is 10<sup>3</sup> CFU/mL.

#### Reproducibility

In order to confirm the reproducibility of the VRESelect™ medium a blinded panel of 6 ATCC reference strains (2 VREfs, 3 VREfm, and 1 vancomycin-susceptible Enterococcus) were tested at three sites. At each site three technicians tested the panel on three lots of VRESelect™ each day for three days. The strains produced the expected results with VRESelect™ 100% of the time at 24 and 28 hours.

#### Challenge Panel

VRESelect™ was evaluated with fifty-six (56) well-characterized strains including vancomycin-resistant and vancomycin-susceptible *E. faecalis* and *E. faecium*, as well as microorganisms commonly isolated from stool. All strains showed expected results.

#### Method Comparison

757 specimens tested on VRESelect™ media (pink or blue colonies between 24 and 28 hours incubation) and BEAV (colonies with dark halos between 24 and 48 hours incubation) plus confirmatory testing (Gram stain, catalase, PYR, Vitek 2 identification and vancomycin (MIC E-Test) showed the following results.

**Table 1**

BEAV +Confirmation vs. VRESelect™ results

		BEAV +Confirmation	
		% Positive Agreement	% Negative Agreement
VRESelect™	24 hrs	98% (118/120, [0.94, 1.00])	97% (615/637, [0.95, 0.98])
	28 hrs	99% (119/120, [0.95, 1.00])	96% (610/637, [0.94, 0.97])*

\* Ten of the 27 specimens that were BEAV plus confirmation negative and grew pink and/or blue colonies on VRESelect™ media, after subculture from VRESelect™ to Blood Agar Plates (BAPs), were confirmed as vancomycin-resistant *E. faecium* and/or *E. faecalis* by Vitek 2 biochemical identification and vancomycin E-Test. Seventeen specimens grew pink and/or blue colonies on VRESelect™ that were not confirmed by Vitek 2 biochemical identification and vancomycin E-Test to be either vancomycin-resistant *E. faecium* and/or *E. faecalis* and represent false positive results.

VRESelect™ (pink or blue colonies between 24 and 28 hours incubation) compared to samples identified as VREfm or VREfs using commercially available biochemical identification system demonstrated the following results.

**Table 2**  
Biochemical identification (Vitek) vs. VRESelect™ results

	Vitek 2 Biochemical Identification	
	% Positive Agreement	% Negative Agreement
<b>VREfm</b>		
VRESelect™ @ 24 hours	97% (94/97, [0.91, 0.99])	97% (639/660, [0.95, 0.98])
VRESelect™ @ 28 hours	98% (95/97, [0.92, 0.99])	97% (639/660, [0.95, 0.98])*
<b>VREfs</b>		
VRESelect™ @ 24 hours	79% (30/38, [0.63, 0.89]) **	97% (696/719, [0.95, 0.98])†
VRESelect™ @ 28 hours	82% (31/38, [0.66, 0.91])	97% (701/719, [0.96, 0.98])

\* Twenty-one (21) specimens not identified as *E. faecium* on the reference arm of the study grew pink colonies on VRESelect™ media. 20 of those specimens, after subculture from VRESelect™ to BAPs, were confirmed as vancomycin-resistant *E. faecium* or *E. faecium/E. faecalis* by Vitek 2 biochemical identification and vancomycin E-Test. One specimen was determined to be false positive.

\*\* Of the eight (8) specimens that were identified as *E. faecalis* by Vitek 2 biochemical identification and did not grow blue colonies on VRESelect™ media, six were shown to be vancomycin susceptible by the reference arm of the study. One specimen grew blue colonies on VRESelect™ after 28 hours and one specimen was determined to be false negative

† Twenty-three (23) specimens not identified as *E. faecalis* on the reference arm of the study grew blue colonies on VRESelect™ media. Thirteen (13) of those specimens, after subculture from VRESelect to BAPs, were confirmed as vancomycin-resistant *E. faecalis* or *E. faecalis/E. faecium* by Vitek 2 biochemical identification and vancomycin E-Test. Ten (10) specimens were found to be false positive (including 6 staphylococci catalase positive).

VRESelect™ (pink or blue colonies observed between 24 and 28 hours incubation) compared to Vancomycin minimal inhibitory concentration (MIC) demonstrated the following results.

**Table 3**  
Vancomycin MIC vs. VRESelect™ results

	Vancomycin Resistance (E-Test)	
	% Positive Agreement	% Negative Agreement
<b>VREfm</b>		
<b>VRESelect™ @ 24 hours</b>	99% (93/94, [0.94, 0.99])	98% (626/637, 0.97, 0.99))
<b>VRESelect™ @ 28 hours</b>	100% (94/94, [0.95, 1.00])	98% (626/637, 0.97, 0.99))*
<b>VREfs</b>		
<b>VRESelect™ @ 24 hours</b>	96% (27/28, [0.81, 0.99])	98% (622/637, [0.96, 0.99])
<b>VRESelect™ @ 28 hours</b>	96% (27/28, [0.81, 0.99])	97% (617/637, [0.95, 0.98])**

Note: Specimens that were identified in the reference arm of the study as vancomycin-resistant and identified as *E. faecium* or *E. faecalis* by Vitek 2 AND grew pink or blue colonies on VRESelect™ were considered in positive agreement.

- \* Eleven (11) specimens not identified as vancomycin-resistant on the reference arm of the study grew pink colonies on VRESelect™, the colonies which grew from 10 of those specimens, after subculture to a BAP, were confirmed to be vancomycin-resistant *E. faecium* by Vitek 2 biochemical identification and vancomycin E-Test. One specimen was determined to be false positive.
- \*\* Twenty (20) specimens not identified as vancomycin-resistant on the reference arm of the study grew blue colonies on VRESelect™. When colonies from those specimens were subcultured to BAPs five were identified as vancomycin-resistant *E. faecalis* / *E. faecium* and 15 were not confirmed to be vancomycin-resistant *E. faecalis* / *E. faecium*, or were vancomycin-susceptible (including 8 staphylococci catalase positive).

### Conclusion

The VRESelect™ showed high diagnostic sensitivity and specificity and accuracy in this study.

### Statement of Safety and Efficacy

The data presented clearly demonstrates the safety and efficacy of the Bio-Rad VRESelect™ as compared to routine culture and identification when results are interpreted after 24 to 28 hours incubation.



OCT 21 2011

Bio-Rad  
C/o Fran White, Regulatory Consultant  
MDC Associates, LLC  
180 Cabot Street  
Beverly, MA 01915

Re: k103684

Trade/Device Name: VRESelect™ Culture Medium  
Regulation Number: 21 CFR 866.1700  
Regulation Name: Culture Media, Antimicrobial Susceptibility Test, Excluding Mueller  
Hinton Agar  
Regulatory Class: Class II  
Product Code: JSO  
Dated: October 19, 2011  
Received: October 20, 2011

Dear Ms. White:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into class II (Special Controls), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part



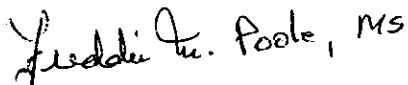
Page 2 – Ms. White

CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820). This letter will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Parts 801 and 809), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/cdrh/industry/support/index.html>.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Sally Hojvat, MS".

Sally Hojvat, M.Sc., Ph.D.

Director

Division of Microbiology Devices

Office of *In Vitro* Diagnostic Device

Evaluation and Safety

Center for Devices and Radiological

Health

Enclosure

### Indications for Use

510(k) Number (if known): K103684

Device Name: VRESelect™ Culture Media

Indications for Use:

VRESelect™ is a selective and differential chromogenic medium, containing 8 µg/mL of vancomycin, for the qualitative detection of gastrointestinal colonization of vancomycin-resistant *Enterococcus faecium* (VREfm) and vancomycin-resistant *Enterococcus faecalis* (VREfs) and to aid in the prevention and control of vancomycin-resistant *Enterococcus* (VRE) in healthcare settings. The test is performed on rectal swabs from patients to be screened for VRE colonization. VRESelect™ is not intended to diagnose VRE infection nor to guide or monitor treatment of infection. Results can be interpreted after 24 to 28 hours incubation. Subculture to non-selective media (e.g., trypticase soy agar with 5% sheep blood) is need for susceptibility testing and epidemiological typing.

Prescription Use   X    
(Part 21 CFR 801 Subpart D)

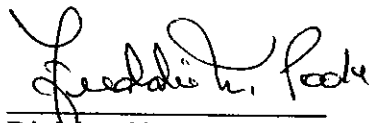
AND/OR

Over-The-Counter Use \_\_\_\_\_  
(21 CFR 801 Subpart C)

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Concurrence of CDRH, Office of In Vitro Diagnostic Device Evaluation and Safety (OIVD)



Division Sign-Off  
Office of In Vitro Diagnostic Device  
Evaluation and Safety

510(k) K103684